Daniel A. Handwerker

CONTACT INFORMATION

Section on Functional Imaging Methods
National Institute of Mental Health
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EDUCATION AND RESEARCH EXPERIENCE

Research Fellow 12/09 – Present
Postdoctoral Fellow 10/07 – 11/09
National Institute of Mental Health
Supervisor: ***Peter Bandettini***, Ph.D.
Using fMRI, DTI and other physiological measures to better understand functional connections across brain regions and the neural basis of those connections.

Postdoctoral Fellow, Department of Radiology 1/06 – 8/07
University of California, San Francisco
Primary Mentor: ***Roland G. Henry***, Ph.D.
Co-Mentor: ***Robert T. Knight***, M.D.
Used fMRI and DTI to study neural changes with dementia and other conditions.

Ph.D., Joint Graduate Group in Bioengineering 8/00 – 12/05
University of California, Berkeley and San Francisco
Assessing Variability of the fMRI BOLD Response to Neural Activity
Mark D'Esposito, M.D. (chair), Richard Ivry, Ph.D., Sarah Nelson, Ph.D.
Studied the methodology and applications of fMRI to cognitive neuroscience, especially focusing on Blood Oxygen Level Dependant signal variability across brain regions, individuals, and clinical populations, and how analyses can account for this variability.

B.S. (Biomedical Engineering), B.A. (Computer Science), Minor (Psychology) 9/96 – 5/00
Johns Hopkins University
Research Mentors:
Steven Yantis, Ph.D. 9/98 – 5/99, 9/99 – 6/00
Studied human attention using psychophysical methods.
Helped design and implement the lab's first fMRI study.
Karen Berman, M.D. (NIH Summer Fellowship) 6/99 – 8/99
Examined brain structure of schizophrenic patients using MRI
Michael Steinmetz, Ph.D. 6/97 – 8/98
Examined the relationships between attention and short-term visual spatial memory in *Macaca mulatto* using electrophysiology and fMRI

PEER-REVIEWED PUBLICATIONS

Yang, Z., Chang, C., Xu, T., Jiang, L., **Handwerker, D.A.**, Castellanos, F.X., Milham, M.P., Bandettini, P.A., Zuo, X.N,. "Connectivity trajectory, across lifespan differentiates the precuneus from the default network" (2014) *Neuroimage* 89, 45-56.

Hutchinson, R.M., et. al. "Dynamic functional connectivity: Promise, issues, and interpretations" (2013) *Neuroimage* 80, 360-378

Handwerker, D.A., Roopchansingh, V., Gonzalez-Castillo, J., Bandettini, P.A. (2012) "Periodic changes in fMRI connectivity" *Neuroimage* 63, 1712-1719

Handwerker, D.A., Gonzalez-Castillo, J., D'Esposito, M., Bandettini, P.A. (2012) "The continuing challenge of understanding and modeling hemodynamic variation in fMRI" *NeuroImage* 62, 1017-23.

Gonzalez-Castillo, J., Saad, Z.S., **Handwerker, D.A.**, Inati, S.J., Brenowitz, N., Bandettini, P.A., (2012) "Whole-brain, time-locked activation with simple tasks revealed using massive averaging and model-free analysis" *Proceedings of the National Academy of Sciences* 109, 5487–5492.

Chu, C., **Handwerker, D.A.,** Bandettini, P.A. (2011) "Measuring consistency of global functional connectivity using kernel regression methods" *Proc. IEEE 2011 International Workshop on Pattern Recognition in NeuroImaging*, art. no. 5961316, 41-44.

Handwerker, D.A., Bandettini, P.A. 2011. "Simple explanations before complex theories: Alternative explanations of Siroton and Das' observations" *Neuroimage* 55(4) 1419-22.

Handwerker, D.A., Bandettini, P.A. 2011. "Hemodynamic signals not predicted? Not so: A comment on Sirotin and Das (2009)" *Neuroimage* 55(4) 1409-12.

Birn, R.M., Murphy, K., **Handwerker, D.A.,** Bandetttini, P.A. 2009. "fMRI in the presence of task-correlated breathing variations" *Neuroimage* 47(3) 1092-1104.

Murphy, K. Birn, R.M., **Handwerker, D.A.**, Jones, T.B., Bandettini, P.A. 2009. "The impact of global signal regression on resting state correlations: Are anti-correlated networks introduced?" *Neuroimage* 44(3) 893-905.

Wilson, S.M., Brambati, S.M., Henry, R.G., **Handwerker, D.A.**, Miller, B.L., Wilkins, D.P., Ogar, J.M., Gorno-Tempini, M.L. 2009. "The neural basis of surface dyslexia in semantic dementia" *Brain* 132(1) 71-86.

Handwerker, D.A., Gazzaley, A., Inglis, B., D'Esposito, M. 2007. "Reducing vascular variability of fMRI data across aging populations using a breath holding task" *Hum Brain Mapp* 28 (9) 846-59.

Fuhrmann Alpert, G., Sun, F.T, **Handwerker, D.A.**, D'Esposito, M., Knight, R.T., 2007. "Information Analysis of Event-Related BOLD Responses: Exploring Spatio-temporal Patterns of Brain Activations." *Neuroimage* 34 (4) 1545-1561.

Handwerker, D.A., Ollinger, J.M., D'Esposito, M., 2004. "Variation of BOLD hemodynamic responses across brain regions and subjects and their effects on statistical analyses." *Neuroimage* 21 (4), 1639-1651.

RECENT CONFERENCE ABSTRACTS

Buchanan, L., Gonzalez-Castillo, J., Hoy, C., **Handwerker, D.A.,** Bandettini, P.A. "Detecting cognitive states with graph theory network metrics" Organization for Human Brain Mapping Annual Meeting 2014

Gonzalez-Castillo, J., **Handwerker, D.A.,** Robinson, M., Hoy, C., Buchanan, L., Saad, Z., Bandettini, P.A. "Mapping the most and least stable connections in the brain" Organization for Human Brain Mapping Annual Meeting 2014

Hoy, C., Gonzalez-Castillo, J., **Handwerker, D.A.,** Buchanan, L., Robinson, M., Bandettini, P.A. "Classifying cognitive states using fMRI network relationships across the entire brain" Organization for Human Brain Mapping Annual Meeting 2014

Gonzalez-Castillo, J., Hoy, C., **Handwerker, D.A.,** Saad, Z., Bandettini, P.A. "How do task demands affect BOLD activation extent at high TSNR?" Organization for Human Brain Mapping Annual Meeting 2013

Handwerker, D.A., Yang, Z., Gonzalez-Castillo, J., Bandettini, P.A. "Identifying features critical to fMRI classification accuracy" Organization for Human Brain Mapping Annual Meeting 2013

Gonzalez-Castillo, J., **Handwerker, D.A.,** Hoy, C. Bandettini, P.A. "Activation extent and tissue specificity of high-TSNR BOLD at 7T" International Society for Magnetic Resonance in Medicine Annual Meeting 2013

Wu, P., **Handwerker, D.A.,** Gonzalez-Castillo, J., Roopchansingh, V., Bandettini, P.A. "The effect of repetition time on fMRI connectivity estimates" Society for Neuroscience Annual Meeting 2012.

Handwerker, D.A., Roopchansingh, V., Gonzalez-Castillo, J., Bandettini, P.A. "A non-neural explanation for some fMRI resting connectivity dynamics" 3rd Biennial Conference on Resting State Brain Connectivity 2012

Gonzalez-Castillo, J., **Handwerker, D.A.,** Robinson, M., Inati, S.J., Bandettini, P.A. "Identification of most and least stable connections in resting state fMRI during hour long continuous resting scans" 3rd Biennial Conference on Resting State Brain Connectivity 2012

Wu, P., **Handwerker, D.A.,** Gonzalez-Castillo, J., Roopchansingh, V., Bandettini, P.A., "The effect of repetition time on connectivity estimates" 3rd Biennial Conference on Resting State Brain Connectivity 2012

Handwerker, D.A., Luh, W-M., Wu, P., Bandettini, P.A. "BOLD and CBF responses during the Valsalva Maneuver" Organization for Human Brain Mapping Annual Meeting 2012

Gonzalez-Castillo, J., Wu, P., Robinson, M., **Handwerker, D.A.,** Inati, S.J., Bandettini, P.A. "Detection of task transitions on 45 min long continuous multi-task runs using whole brain connectivity" Organization for Human Brain Mapping Annual Meeting 2012

Robinson, M., Gonzalez-Castillo, J., Inati, S.J., **Handwerker, D.A.,** Bandettini, P.A. "Identification of State changes from spontaneous fluctuations in fMRI Data" International Society for Magnetic Resonance in Medicine Annual Meeting 2012

Handwerker, D.A., Wu, P., Evans, J.W., Bandettini, P.A. "Identifying origins of MRI signal changes due to breath holding using multi-echo fMRI" Society for Neuroscience Annual Meeting 2011.

Handwerker, D.A., Gonzalez-Castillo, J., Starkel, C., Bodurka, J., Bandettini, P.A. "The effects of flip angle on estimated fMRI functional connectivity" Organization for Human Brain Mapping Annual Meeting 2011

SELECTED TEACHING AND TALKS

National Institutes of Health

Panel on "What's a good fMRI study? What's a bad fMRI study?"	8/15/12
Panel on "How can fMRI make inroads in clinical applications"	8/13/12
"Basics of Resting State fMRI"	7/12, 7/13
Panel on "What is a good or bad fMRI study and clinical uses"	8/26/11
"Connectivity of fMRI fluctuations"	7/12,15/11 8/17,19/10
"Altering chest pressure to measure cerebrovascular reactivity"	1/28/11
"Global signal changes with chest pressure"	8/9/10
"Diffusion-based tractography: Methodology and Applications"	7/15/10
"Properties of resting state fMRI"	8/5/09
"Introduction to Diffusion Tensor Imaging"	2/11/09
"Quantifying and managing fMRI BOLD response variability"	4/20/07

Applied Physical Society Annual Meeting

"Noninvasive, dynamic human brain imaging with fMRI"	3/2/14

Children's National Medical Center

"Challenges and Opportunities for resting state fMRI"	9/14/12

Foundation for Advanced Education in the Sciences

"Introduction to fMRI" (lectures in an MRI course)	11/21,28/11 11/29/10

National Security Agency

"Reliability and Resting State fMRI"	3/18/09

Johns Hopkins University

Biomed Engineering 580.202 *"BME in the real world: Getting and using a Ph.D."*	4/1/08

JOURNALS REFEREED

The American Journal of Psychiatry
Frontiers in Human Neuroscience
Frontiers in Neuroscience Methods
Human Brain Mapping
Journal of the American Academy of Child and Adolescent Psychiatry
Journal of Cerebral Blood Flow and Metabolism
Journal of Neuroscience Methods
Neuroimage
PLOS ONE

PROFESSIONAL SERVICE

National Institutes of Health
Mentored and helped many members in the Section on Functional Imaging Methods 10/08 – Present
Includes being the primary manager of three post-baccalaureate research assistants

University of California, Berkeley
Graduate Assembly Mental Health Task Force 9/03 – 5/05
University Health Services Advisory Committee on Graduate Mental Health 10/03 – 5/05
Helped organize, conduct and publicize one of the first surveys of graduate student mental health in the nation and draft the preliminary documents for the UC Berkeley Chancellor's Mental Health Task Force.

UC Berkeley / UC San Francisco Joint Graduate Group in Bioengineering
Qualifying Exam Advisor 9/03-9/04
Advised students on how to prepare for their research qualifying exams.
Attended many practice exams and gave comments.
Updated much of the department advice literature on qualifying exams.

Peer Mentor 9/01 – 9/02
Coordinated all student-based guidance of incoming graduate students.
Began & facilitated a web-group so current students could help incoming students.
Completed a major revision of the orientation materials for incoming students.

PROFESSIONAL MEMBERSHIPS

Organization for Human Brain Mapping
Society For Neuroscience
Tau Beta Pi - Engineering Honor Society
Alpha Eta Mu Beta – Biomedical Engineering Honor Society